

10/542102

JC14 Rec'd PCT/PTO 11 JUL 2005

EXPRESS MAIL NO. EV 321885932 US
[2345/218]

ADMINISTRATOR FOR AUTOMATICALLY ADAPTING A TRANSMISSION CHANNEL

The present invention relates to a method for exchanging data using a wireless connection, a user having one or more portable terminals being located in the transmission and reception range of at least one network, the terminal or 5 terminals automatically logging on to the network in order to establish a connection, and a transmission channel being made available for the data exchange within the framework of the connection established in each case. The present invention is also directed to a system for implementing the method.

10 Depending on a user's exact whereabouts, more or fewer possibilities are available to him for exchanging data via wireless connections. More often than not, the user is in the service area of GSM [Global System for Mobile Communications] networks for mobile telephony, while short-range radio 15 communications networks such as Bluetooth or WLAN [wireless local-area network] are only available to him on certain occasions.

The exchange of large volumes of data is generally associated with different expenditure in terms of transmission time and 20 cost, depending upon the type of connection usable at the moment. For this reason, the user has an interest in waiting with the download of an MP3 data file, for example, until he gets into the Internet via WLAN. He will not want to retrieve the data file via GSM. Thus, the user will wait until the 25 terminals he is carrying with him get into the service area of a distributor or access point which provides them with access to external networks via a local network. So-called "cafe computing" would be a special exemplary embodiment of such

local networks. It is based on the already established concept, according to which a user goes into a cafe, for instance, opens his laptop, logs wirelessly (e.g., Bluetooth) onto the local network of the cafe via an access point, and 5 answers E-mails or surfs the Internet while enjoying a cappuccino. Located next to him is also his cellular phone, with which he telephones via GSM, or exchanges SMS [short messaging service] messages.

When working with such devices, it is again disadvantageous 10 that a maximum bandwidth is reserved for each unit logged onto the cafe access point, even if the user needs only a little capacity at the moment. Consequently, resources are wasted unnecessarily for relatively modest requirements. From the cafe operator's point of view, this is unsatisfactory, since 15 resources which he could profitably offer to other users are being blocked.

The object of the present invention is now to provide a method 20 for data exchange within the framework of such concepts, which may easily be implemented by cost-effective means, and which automatically ensures efficient distribution of the available 25 resources, accompanied by great ease of operation, and which therefore contributes to an increase of acceptance.

These objectives are achieved by the method having the characterizing features of Claim 1, and by the system as 25 recited in Claim 10.

The background of the invention lies in recording the whereabouts of a user and his respective terminals and, depending on the whereabouts, automatically making available to him the connections that are possible there, and have the 30 capacity needed for the data exchange. This adaptation relates to the type of terminal or terminals and the type, especially the quantity, of data waiting for transmission. It is

accomplished automatically by the administrator assigned to
the network.

The present invention is able to manifest on two levels. Thus,
the user, having his terminals, may stay at one location,
5 e.g., in the area of a cafe access point, over the duration of
the connection. The result of the inventive method is that the
administrator assigned to this "internal" network then makes
an optimized connection available to the user. On the other
hand, in a superordinate level of the method, the movement of
10 the terminals across the boundaries of networks is monitored,
and depending on the whereabouts, connections are produced to
the networks established there. The user is thus able to move
freely, while the system takes care that he is able to
accomplish his data transmission, in each case under optimized
15 marginal conditions, particularly with respect to costs,
security and/or transmission performance. Among the channels
available, that one is selected which is suitable for
fulfilling the task, this channel moreover being adjustable in
its transmission capacity. Thus, the administrator assumes the
20 function of a router which automatically selects the best
possible transmission path. It can also be advantageous if the
user is able to predefine priorities.

To implement the method within the framework of a local
network, e.g., in a cafe, a permanently installed device is
25 advantageously used as administrator, the portable terminal
gaining access to an external communication network,
particularly the Internet or a telephone network, via the
administrator. In this case, the connection between the
terminal and the administrator is established via a short-
30 range radio communication network, especially Bluetooth or
WLAN.

Thus, according to the present invention, the available possibilities and resources are adapted flexibly to the instantaneous requirements. In order to accomplish this, in one advantageous specific embodiment, first of all the type of portable terminals to be assigned to a user, as well as the type of data waiting to be transmitted are ascertained. On the basis of the conditions thus ascertained, one connection is then selected from a plurality of connections available. Ultimately, the connection is established and cleared between the distributor and the portable terminal.

Moreover, it is advantageous if usage of the local network is possible with different terminals. Thus, it is unimportant what communication device the user entering the cafe is also carrying with him. He is able to make use of a PDA, a laptop or a BlackBerry. According to the present invention, the communication with the terminal is possible via the wireless network of the cafe, without an external provider, accompanied by additionally accruing costs, being needed. The administrator obtains the information, transmitted or detected automatically, as to what devices are available to the user, and selects one of the devices and the type of connection optimized to the data.

As already explained, it is advantageous if the administrator selects the bandwidth (capacity) as a function of the amount of data to be transmitted.

The greater the quantity of data waiting, the greater the bandwidth it will select, in order to attain a comfortable transmission rate. In selecting the bandwidth, the administrator will orient itself to how high the overall load is at present, and what total transmission duration at most it may probably expect of the user. In this context, depending on the direction of the data transmission, the need may be

ascertained automatically or by a message sent in advance. In the case of transmission to the terminal, by analysis, the administrator is able to learn the type, particularly the extent and the transmission standard, of the data waiting on its side for transmission. For instance, if it determines that it is a larger MP3 file, it will make a WLAN connection having higher bandwidth available, while for a small E-mail, a Bluetooth connection with low bandwidth is preferred, for example.

If the intention is to transmit from the terminal to the administrator, it is advantageous to first send a brief message about the type of data waiting on the side of the terminal, in a kind of header. Based on this information, the administrator is able to set up an optimal connection. In this context, it is advantageous if each terminal permits the user to define certain usage profiles in advance. Based on the usage profiles, the device ascertains the bandwidth probably needed, and relays this, particularly via the header, to the administrator. Therefore, each device within the reception radius has made available to it only the bandwidth it is anticipated to need. In one advantageous specific embodiment, it is possible for the distributor to change between bands in the course of a connection, depending upon the requirement. For example, the subject of the fetched E-mail could be sent via Bluetooth, and the annex via rapid WLAN. The user will not notice the switchover between the connections on his laptop. Such a change also exists when information about the type of data that are following is initially exchanged via a first band, before the data are exchanged via another band adapted to the type.

It is also advantageous if profile data, which bring about a prior determination of tasks to be accomplished, are predefined to the system. Consequently, the terminal is able

to undertake a specific transmission automatically, as soon as it is located in the reception range of an administrator, and without the user having to repeat this process himself each time.

5 This type of "flexible" interface according to the present invention offers various advantages: Thus, by the definition of this interface standard, which permits an adjustment of various profile data of individual devices and users with the administrator, it is possible to optimally organize specific
10 bandwidth requirements, while at the same time, a convenient automation of services is ensured. For the user, the invention offers a high degree of convenience, since many steps are carried out in automated fashion. For the operator of the local network, who makes a profit at the location where the
15 service is made available, it is advantageous that his network is optimally utilized, thus maximizing earnings.

The present invention is elucidated in the following, using an exemplary embodiment.

In the example, the user has a laptop and a cellular phone
20 which includes organizer functions. The laptop he uses substantially privately. On a suitable Internet page, he has found software offers of interest to him, and has assembled them for the download. For time reasons, however, he wants to undertake the actual download only when a certain downstream
25 bandwidth is available to him. He uses the cellular phone professionally for managing E-mail and appointments. In his user profile, he has specified to undertake a synchronization with the corporate network as often as possible. To save time, however, he has only the subject lines of the individual
30 messages transmitted, in order to be able to sort out unimportant messages.

If the user now enters a cafe which makes a wireless access point available, his devices perceive this independently. They establish the necessary connection autonomously, taking into account the bandwidths required, and fulfill the tasks set beforehand. While the laptop undertakes the notified download with the greatest possible bandwidth, the cellular phone reserves for itself only a small bandwidth, e.g., of the Bluetooth connection, and synchronizes itself automatically with the corporate network. The services therefore follow the user, without him having to reactivate and configurate them in each instance.

The method of the present invention is implemented using an administrator which has a first interface to an external network, especially the Internet and/or a telephone network, and a second interface to a local network, via which a short-range radio link, suitable for the data transmission, is able to be established to a terminal present in the transmission and reception range. In addition, the administrator has a router module, realized in particular by a computer program, which determines the type of data waiting for transmission, and establishes a connection, corresponding to the type, to a terminal. This connection is optimized in light of the terminal available, the costs and/or the transmission speed.